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**Biedermann Packaging Inc. Fire
MOE Response and Prevention of Future Incidents
July 17, 2009**



**Hamilton District Office
West Central Region
Ministry of the Environment**

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Introduction

After the July 26, 2007 fire at Biedermann Packaging Inc., the Ministry of the Environment reviewed our regulatory role and compliance activities with the company. This analysis identified ways the ministry can help protect against future environmental impact from the Biedermann operation or similar incidents at other Hamilton area industries.

This report is a summary of the ministry's involvement with Biedermann Packaging prior to the fire, the ministry's actions to respond to the fire and what we have done since to reduce the risk of future incidents at the Biedermann facility that can affect the community and the environment. Included in this report are a number of actions taken by the ministry to require additional proactive and preventive efforts by industry to minimize future emergency incidents.

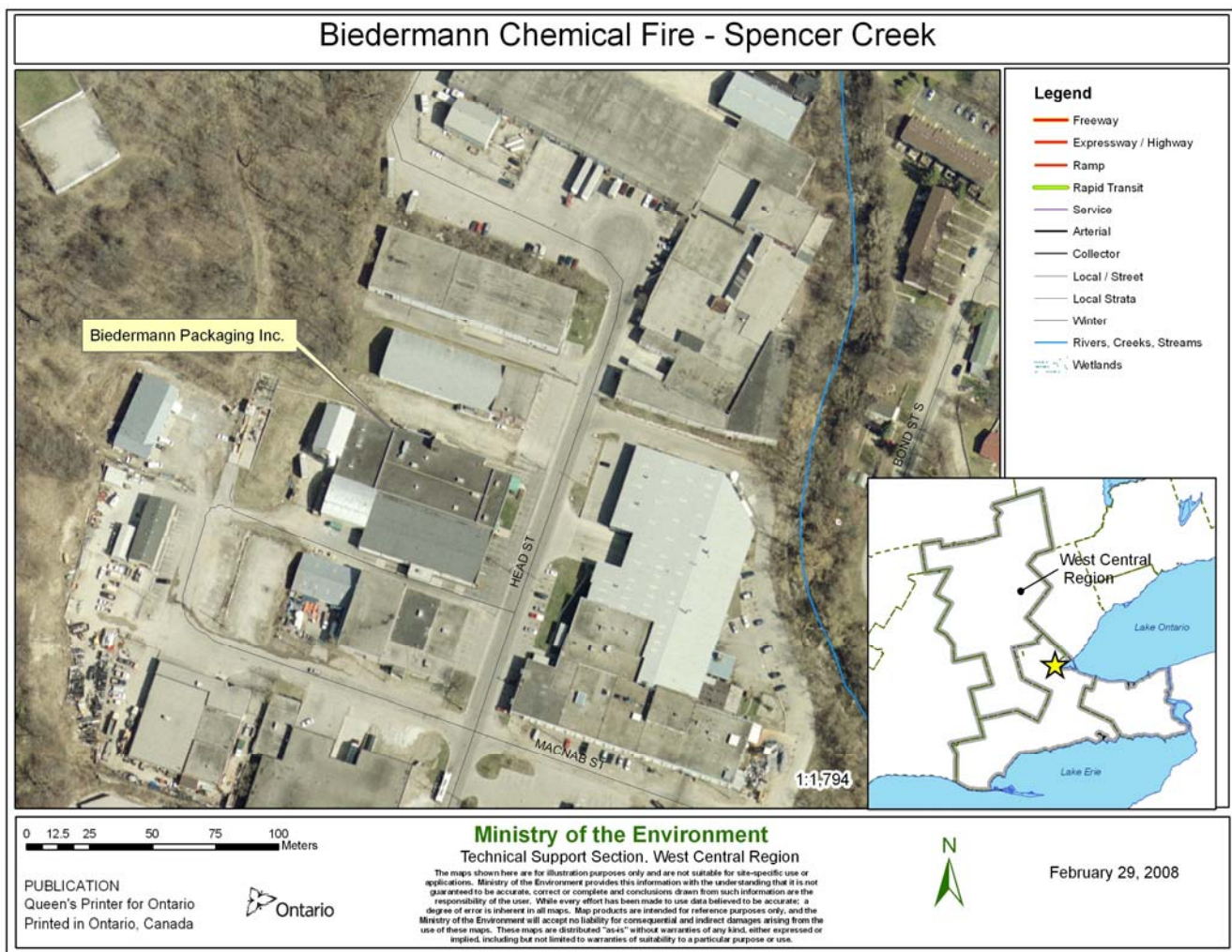
This report also summarizes the results of the ministry's regulatory investigation to determine if any offences occurred under Ontario's Environmental Protection Act and whether charges were warranted.

This report is limited to the legislative authority of the ministry within the City of Hamilton.

Company Background

Biedermann Packaging is located in the Dundas area of the City of Hamilton. It is a toll packaging plant, contracted by retail and vendor companies to formulate, package or repackage a wide variety of pesticide products.

Biedermann Packaging purchased the Head Street facility from Wilson Chemicals, a retail and wholesale vendor, in 1999. Unlike Wilson Chemicals, which sold pesticide products in the retail or wholesale marketplace, Biedermann Packaging is contracted by other companies to supply custom products for their home and garden markets. The products include seed treatment products, granular fertilizers, ice melters, rodenticides and insecticides in consumer or bulk containers ranging from 25 grams to 1000 kilograms.



Ministry Compliance Activities: Pre-Fire

Prior to the fire, the most recent compliance inspection of the Biedermann Packaging facility and operation occurred in January 2005. The company was in full compliance with its Certificates of Approval and passed the inspection.

In 2007, Biedermann Packaging had two Certificates of Approval from the ministry for specific aspects of their operations:

1. Certificate of Approval 8-2115-80-987 (1998): for a dust collector to control particulate emissions from a pesticide/fertilizer formulation process.¹
2. Certificate of Approval 4-0109-97-996 (1997): for sewage works used for the collection, transmission and discharge of storm water from the tank truck unloading area and access lane at the garden chemical manufacturing plant.²

At the time of the 2007 fire, the Pesticides Act and regulations that apply to the sale, use, transportation, storage and disposal of pesticides primarily regulated the end user. As a manufacturer, Biedermann Packaging was exempt from certain provisions of the legislation. Although the company was not required to comply with the Pesticides Act, it was operating in accordance with the General Vendor requirements, including notification to the local fire department of the presence of pesticides and sharing the company's emergency response plan.

Biedermann Packaging was recently inspected by the ministry in May 2009 and found to be in full compliance with the requirements of its pesticide vendor license.

The Ministry's Role During Emergency Incidents

The ministry is the lead regulatory agency for spills of pollutants or contaminants discharged into the natural environment in Ontario.³ Municipal authorities such as police, fire or local public health officials usually provide the lead role for emergency incidents that pose a threat to human health and community safety. During these incidents, the ministry provides advice and direction on how to contain and clean up environmental impacts.

Specifically, the ministry:

- determines the nature and extent of environmental contamination or damage resulting from the emergency
- provides information and advice as requested by local Emergency Services or the Medical Officer of Health

¹ Amended in 2004 to change the name. A change of name/ownership for 8-2115-80-987 and 4-0109-97-996 was issued March 12, 2004 after receiving a letter from the company February 16, 2004.

² C of A was subsequently revoked at the request of Biedermann Packaging Inc. (2009).

³ Exceptions to this include ship-source spills to waterways (including lakes, rivers and canals) and international boundary water spills, for which the Canadian Coast Guard assumes the lead; and spills at federally regulated facilities, for which Environment Canada assumes the lead.

- recommends appropriate procedures to address contaminants and evaluates the adequacy of the cleanup and disposal efforts
- collects samples, photographs and other pertinent information
- enforces the Environmental Protection Act and requires those responsible for the environmental threat to take appropriate actions to address the situation, and
- documents all findings, actions, recommendations and other pertinent information.

Ministry's Response to the Biedermann Fire: Chronology

On July 26, 2007 at approximately 2:30 a.m., the Hamilton Fire Services informed the ministry's Spills Action Centre (SAC) of a fire at Biedermann Packaging. SAC contacted the environmental response person (lead environmental officer) in the ministry's Hamilton District who arrived at the Biedermann site shortly after 4:00 a.m.

Once on site, the lead environmental officer reported to the fire department's incident command center, where incident command officials briefed all responding agency personnel on the fire, containment and possible environmental impacts from the fire.

Shortly after, the lead environmental officer observed significant amounts of douse water entering the storm sewer that discharges into Spencer Creek. He immediately instructed the company to take measures to stem the flow of the douse water. In response to the ministry's direction, the company secured the services of Echelon Response & Training Inc. This firm was originally retained by the city to deal with runoff and douse water. Despite Echelon's actions to contain the douse water, full containment was not achieved for several hours due to the volume of water required to suppress the fire and the close proximity of the facility to Spencer Creek.

To understand and manage the extent of the environmental impact caused by the fire, the lead environmental officer instructed the company to provide an up-to-date inventory of the chemicals known to be onsite at the time of the fire to the ministry and the fire department. Company representatives could not provide a full account of the on-site inventory because they had no detailed records outside the building.



Fire burns through the roof of the Biedermann Packaging facility.



Douse water enters the storm sewer catch basin on Head Street.

To assess the impact of the douse water on the environment, the lead environmental officer took samples of the douse water at the site, from the outfall of the storm sewer where it had discharged into the Spencer Creek and a base-level sample upstream from the outfall.

By early morning, vacuum trucks sub-contracted by Echelon were on site and pumping up the douse water. The captured douse water was eventually shipped to Quantex, a ministry approved environmental waste treatment company located in Toronto.

At approximately 6:00 a.m., the Hamilton Fire Services requested additional ministry staff attend the site to perform air monitoring. The ministry's additional technical support staff arrived at 8:00 a.m. and set up air monitoring equipment upwind and downwind from the site. This equipment monitored for various air contaminants including nitrogen dioxide (NO₂), toluene, xylenes and butadiene, which are chemical indicators of a broad range of organic contaminants, and helped determine the need for more detailed or extensive testing.

Although there were elevated levels of NO₂ and xylenes, these were consistent with levels typically found in structural fires. All other contaminants were below the detection limits of the monitor, and, therefore, below ministry standards or guidelines (Refer to **Appendix A** for complete set of air monitoring data).

Around 11:00 a.m., the Hamilton Conservation Authority informed the ministry about reports of 60 - 70 dead fish in Spencer Creek. Two additional environmental officers assessed the creek and observed several dozen dead or distressed fish, the smell of douse water and discoloured creek water. The environmental officers immediately called for more support and took samples of the creek water and dead and distressed fish. Ministry technical support staff arrived at the creek by 1:00 p.m. to assist with the sampling.



Ministry staff collected dead fish from Spencer Creek for further testing.

The lead environmental officer informed the command centre and company representatives about the impact to the creek from the douse water and magnitude of the fish kill. Again, the lead environmental officer requested company representatives provide a detailed inventory of all chemicals stored at the site to the ministry. This would serve as a guide for what contaminants to test for in the samples and help identify the specific cause of the fish kill.

At this time, the lead environmental officer learned that the still smouldering building contained approximately 6-18 inches of douse water. The lead environmental officer reviewed the clean up and containment plan with the company and checked on the progress of the contractors hired to implement the clean up.

The ministry staff then began to assess the full extent of the fire and douse water impact to Spencer Creek. Two environmental officers walked the length of the creek from the outfall location to where the creek discharges into the Desjardins Canal, at which time they observed several hundred dead and distressed fish. The strong smell of smoke from the douse water was still present and the water remained noticeably discoloured.



A dead trout is collected for testing.



Evidence of dead fish in lower Spencer Creek.

The environmental officers returned to the fire site to send a vacuum truck to the outfall of the storm sewer to contain and prevent any further discharges into the creek. The environmental officers instructed the Biedermann representatives to prevent further off-site contamination and to clean up the impacted areas, which included scouring the storm sewer. The officers also told the company to arrange for collection of the dead fish to prevent any further impact to wildlife.

By early evening, the lead environmental officer observed impacts along the length of the creek to the aquatic life forms that are food for fish (e.g., the larvae of insects living in or on sediments and crustaceans such as crayfish).

Throughout the remainder of the day, a number of ministry staff performed air and water sampling, worked with the incident command team (including members of the fire department, the City of Hamilton, Public Health), and monitored for any other environmental impacts.

Extensive sampling continued throughout the next day. Initial lab results received on July 27, 2007 confirmed that toxic substance(s) had entered the creek. The ministry shared these results with Hamilton Fire Services, City of Hamilton, Public Health, Hamilton Conservation Authority, Royal Botanical Gardens and local media.

Ministry staff continued to work on site throughout the weekend and the early days of the following week to ensure the company carried out the clean up of the fire site as planned, and to minimize the possibility of any additional environmental impact.

On July 28, 2007, Biedermann representatives provided the ministry with a detailed inventory of all chemicals on the site prior to the fire. The ministry shared this information with the other agencies and the media on Monday, July 30, 2007. The company gave an updated and final version of the inventory to the ministry on August 8, 2007 (refer to **Appendix B**).

Test results from samples of douse water taken from the site on July 26, 2007 confirmed trace amounts of diazinon, malathiaon, carbaryl, bendiocarb and carbamate insecticides, products confirmed by Biedermann staff to be in the facility at the time of the fire. The ministry shared these results with the other agencies and local media on July 30, 2007.



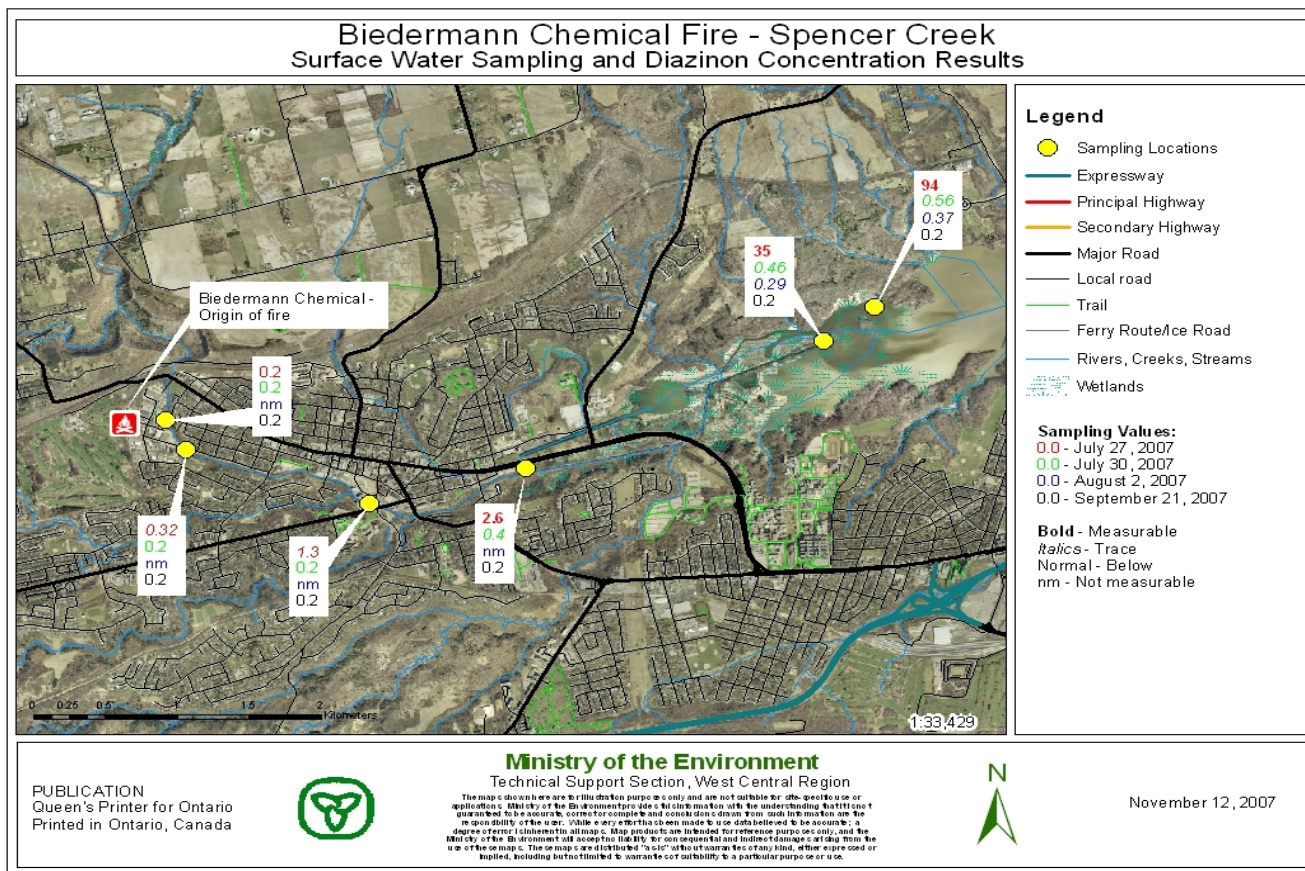
A Hamilton Conservation Authority notice advises people to avoid contact with the creek.

The ministry collected extensive water and sediment samples in the week following the fire, and again several months after the incident. The results indicate that within two days after the fire, diazinon (a pesticide) was found in Spencer Creek at trace amounts, which is consistent with concentrations previously found by Environment Canada in unrelated testing. Test results did not detect malathion, carbaryl, bendiocarb and other carbamates in Spencer Creek on either July 27 or July 30, 2007. The sampling confirmed that, within a day of the fire, no detectable concentrations of pesticides were found in the creek water.

Further results confirmed that water quality was back to normal in less than a week and sediments were normal in just over a month. The ministry shared these results as they came back from the lab with the agencies involved and local media.

During the following month, ministry staff were frequently on site to monitor the clean up efforts and continue assessing the extent of the impact to the local environment.

In August 2007, the ministry advised the local community, municipal agencies and local media that use of Spencer Creek could return to normal. Although the creek suffered considerable environmental damage because of the fire, it was safe for public use.



The above map shows Biedermann Packaging in relation to Spencer Creek and Cootes Paradise, and sampling locations in the creek where pesticides (diazinon) were detected at the time of the fire. A complete set of water sampling results is provided in **Appendix C**.

Compliance Activities – Post Fire

Spill Prevention and Contingency Plan

At the time of the fire, Biedermann Packaging had a spill prevention and contingency plan to prevent or reduce the risk of spills during its operations and to prevent or limit any adverse effects that might result in the event of a spill.

The Biedermann facility was equipped with containment features designed to hold 1 million litres (approximately 200,000 gallons) of spilled material or fire douse water. This is a significant containment capacity that most industries do not have. However, a far greater volume of water was used to suppress the fire than could be held by the existing spill containment features.

As part of the company's plans to rebuild its facility, they doubled their containment capacity to hold 2 million litres (more than 430,000 gallons) of spilled material or fire douse water. Although this containment volume is significant, it still falls short of the amount of water applied to the fire on July 26,

2007. The new Biedermann Packaging building is now equipped with fire suppression sprinklers, which greatly reduces the likelihood that the same amount of douse water would be needed to suppress a similar fire.

As a result of the fire, the ministry requested the company enhance its spill prevention and contingency plan to meet the new, more stringent standards that apply to 115 large industrial companies in Ontario. Plans developed under this regulation require a more thorough spills analysis and risk evaluation to develop spill prevention and contingencies for emergencies. Although Biedermann Packaging is not a large industry, the ministry determined this level of planning is appropriate given the type of product handled by the company and the proximity to an environmentally sensitive area.

Fire Suppression System

Assessments following the fire by the fire department and the ministry concluded that a fire suppression system in the Biedermann Packaging facility would have greatly reduced the amount of douse water required to put out the fire by helping to extinguish the fire in its early stages. However, the city's building code for this type of structure did not require a suppression system. At the request of the ministry, the company installed fire suppression equipment throughout the entire plant facility during its rebuilding process.

Creek Rehabilitation

After the fire incident, the ministry began working with the Hamilton Conservation Authority (HCA), Ministry of Natural Resources, Royal Botanical Gardens and City of Hamilton to determine what, if any thing, needed to be done to speed the recovery of Spencer Creek. They established a multi-stakeholder group of technical experts to identify appropriate restoration priorities for the impacted section of Spencer Creek and Cootes Paradise Marsh.

The technical experts assessed a number of options, and determined the most effective strategy to restore the affected portion of lower Spencer Creek is to remove barriers to fish movement such as dams, debris jams and artificial channels to naturalize the watercourse and enhance the long-term sustainability of the aquatic community. This option was preferred because it:

- is in agreement with previous recommendations for the ecosystem,
- has the ability to promote natural re-colonization of species, and
- will enhance conditions beyond those existing prior to the fire.

Biedermann staff met with the Hamilton Conservation Authority and the ministry to offer assistance in the implementation of the Spencer Creek restoration effort. The company also offered to assist in barrier removals such as the Osler Street Dam. The dams in the creek are a barrier to fish migration and slow down the rehabilitation of the creek. One solution proposed for the dams is the construction of a fish ladder(s). The type and amount of assistance that will be most helpful from the company is still to be determined.

This group continues to oversee the nature and timing of activities to improve the creek. The ministry continues to support these efforts with ongoing sampling and monitoring to evaluate the recovery progress.

Attached in **Appendix D** of this document is the final version of the *Spencer Creek Restoration Action Plan, in Response to the Biedermann Fire (January 2008)*.

Included in **Appendix E** of this report is the updated *Sediment Sampling Results* from samples taken by the ministry in June 2008, and a summary of an updated aquatics survey carried out by the Hamilton Conservation Authority. The June 2008 sampling results indicated that no detectable levels of pesticides were found in the sediment in Spencer Creek. Studies by the Hamilton Conservation Authority also suggest that insect larvae, crustaceans and fish populations have also recovered. Although the total numbers of fish are still less than they were prior to the fire, the diversity of the aquatic life has returned.



Osler Street Dam

Ministry Investigation

On August 9, 2007, the ministry's Hamilton District Office referred the Biedermann Packaging fire to the Investigations and Enforcement Branch (IEB), to determine if any offences occurred under Ontario's Environmental Protection Act. The investigation began on August 13, 2007.

Early in the investigation process, IEB investigators assessed that if a cause of the fire was identified, it would provide the ministry with significant direction for the investigation, and investigators could then focus on whether Biedermann Packaging had negligently contributed to the fire and the environmental impact of the fire.

The Office of the Fire Marshal (OFM) is the authority responsible for investigating the origin, cause, and circumstances of fires. The OFM began an investigation in August 2007. While the OFM investigation progressed, IEB investigators gathered evidence about the company's operation and its industry standards. They obtained numerous witness statements, as well as information about Biedermann Packaging's facility, municipal and provincial approvals and its emergency response plan. Investigators also collected information on national and international standards for the storage and formulation of pesticides.

In January 2008, ministry technical experts completed their report on the environmental impact of the fire and douse water, and concluded that impairment to Spencer Creek was caused by douse water containing a number of pesticides, including diazinon. Ministry staff estimated that approximately 900,000 to 1,200,000 litres of contaminated douse water entered Spencer Creek.

Also in January 2008, the ministry received a draft copy of the OFM Fire Investigation Report and a copy of the Fire Engineer's Report. The report indicated the cause of the fire was undetermined.

After reviewing the draft Fire Investigation and Fire Engineer's reports, and the ministry's technical report on the environmental impact, IEB investigators refocused the ministry's investigation on the company's preparation for a fire, their emergency response plan and implementation of the plan during the fire, including the management of the fire and the douse water.

In April 2008, IEB retained an external fire protection specialist to advise on these fire safety issues. An extensive amount of additional material was required for the expert's review.

This phase of the investigation focused on whether Biedermann Packaging had demonstrated due diligence in its effort to anticipate and prepare for a fire emergency. Specifically, investigators looked at the standard of care taken by Biedermann Packaging to:

- develop an appropriate emergency response plan,
- implement their response plan on the day of the fire,
- take other actions to address the environmental impacts of the fire, including the douse water run-off, and
- reasonably foresee in its preparation for a fire at the facility the nature of the fire, the manner that it was extinguished and the volume of douse water used during the suppression effort (in excess of 5 million litres).

IEB received the expert's report in December 2008. After receiving and reviewing the expert's report, IEB sent it to the OFM for a peer review. Following the OFM peer review, IEB consolidated all the investigative information, reviewed and assessed all the evidence and concluded its investigation. The findings of the investigation were submitted to the Crown Prosecutor in June 2009.

Ministry Findings

The findings of the investigation were reviewed by a Crown Prosecutor.

The Crown Prosecutor concluded there would not be a reasonable prospect of conviction as Biedermann Packaging Inc. would be able to raise a defence of due diligence. There is sufficient evidence that the company took all reasonable care to avoid any foreseeable discharge of the douse water to Spencer Creek.

The ministry will only proceed with charges if it is determined that there is sufficient evidence to support a reasonable prospect of conviction and it is in the public interest.

Other Ministry Activities

Following the fire, the ministry assessed for additional abatement actions or regulatory changes that could help minimize future events of this kind.

Spill Prevention and Contingency Planning

During routine ministry inspections in Hamilton, environmental officers now require, where necessary, improvements and updates to spill prevention and contingency plans for any company that poses a higher risk for environmental impacts.

As part of the ministry's ongoing work to educate industry about their responsibilities under Ontario's air pollution and local air quality regulations, the Hamilton District Office includes a spill prevention and contingency planning component in presentations to higher risk companies. This is helping to educate a larger number of companies on the significance of contingency planning to protect the environment.

Working Collaboratively with Other Agencies

During the follow up to this incident, it became apparent that the ministry and Hamilton Fire Services could benefit from improved information sharing that will improve the effectiveness of all agencies when responding to emergencies.

The ministry's Hamilton District Office has initiated ongoing dialogue with Hamilton Emergency Services to discuss industrial sites in the City of Hamilton that pose a high risk and benefit from inspections that are more frequent by both agencies.

In addition, the ministry requested Biedermann Packaging install a lock-box at the facility gate containing important company information, such as an up-to-date inventory of all chemicals stored on site, which the company has done. Hamilton Emergency Services is supportive of this action so that, in the event of an emergency, response agencies now have immediate access to this information. The ministry is recommending the lock-box concept at other industrial sites in Hamilton.

Regulatory Oversight

The fire drew attention to concerns that companies manufacturing pesticides, but not selling finished products, are exempt from certain provisions of the Pesticide Act, and therefore, lacking regulatory oversight.

In response to these concerns, Ontario amended the regulation under the Pesticide Act on April 22, 2009, to require manufactures and commercial formulators of pesticides to be subject to the same storage and notification requirements that exist for vendors and operators. These requirements ensure local fire departments know where pesticides are stored, and that they are stored in a manner that protects public health and the environment.

Toxics Reduction

As part of Ontario's Toxics Reduction Strategy to reduce toxics in air, land, water and consumer products, Ontario has passed the Toxics Reduction Act. Regulations to be developed under the act will require designated facilities to track and evaluate their current use and creation of toxics, develop plans to reduce the use of toxics, and make summaries of their plans available to the public. This summer, the ministry will begin consulting with stakeholders and the public on draft regulations including substances, industrial sectors and compliance timelines.